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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,971	01/15/2004	Klaus Hartig	44046.203.143.22	8328

22859 7590 03/22/2007

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EXAMINER	
PIZIALI, ANDREW T	
ART UNIT	PAPER NUMBER
1771	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/759,971	HARTIG ET AL.	
	Examiner	Art Unit	
	Andrew T. Piziali	1771	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 February 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,5-9,11,13,15-20 and 24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,5-9,11,13,15-20 and 24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 November 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/31/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3, 5-7, 9, 11, 13, 15-17, 19-20 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,090,481 to Depauw et al. (hereinafter referred to as Depauw) in view of USPN 5,248,545 to Proscia.

Regarding claims 1, 3, 5-7, 9, 11, 13, 15-17, 19-20 and 24, Depauw discloses a coating carried by a substrate having a surface comprising from the substrate surface outwardly an inner dielectric layer, a first infrared reflective layer, an intermediate dielectric layer, a second infrared reflective layer, and an outer dielectric layer (column 3, lines 26-39). Depauw discloses that each dielectric layer can be a composite layer formed of successive subsidiary layers of different compositions from each other (column 5, lines 31-40 and Table A). Depauw discloses that the dielectric materials include zinc oxide, tin oxide, and silicon nitride (column 5, lines 23-30). Depauw discloses that the physical thickness of each layer of a composite layer may be no more than about 250A (Table A). Therefore, Depauw discloses a coating carried by a substrate comprising an intermediate dielectric stack comprising zinc oxide/silicon nitride/zinc oxide/silicon nitride/zinc oxide.

Depauw does not mention a specific embodiment wherein each of the layers of the first dielectric have an optical thickness greater than the optical thickness of any of the layers of the second dielectric, but DePauw does disclose that a variety of layer thickness combinations may be utilized (see Table A). Depauw appears to be silent with regards to why the intermediate dielectric stack thicknesses are to be varied, therefore, it would have been obvious to look to the prior art for the reason. Proscia provides this conventional teaching by disclosing that the optical features and properties (transmittance, reflectance, emissivity, and color) of a glass coated article can be readily determined empirically by those skilled in the art or, for example, by employing a commercially available optics prediction software program. Proscia discloses that typically a graphic presentation of the optical properties of a given glazing article, sorted by individual layer thickness and refractive index, can be used to determine the regions of optimum film stack design (see entire document including the paragraph bridging columns 6 and 7). Considering that the current specification fails to teach or suggest unexpected results relating to the claimed thickness construction, and considering that the applicant fails to evidence any unexpected results associated with the claimed thickness construction, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the thicknesses of the layers, such as currently claimed, because it is understood by one of ordinary skill in the art that layer thicknesses determine properties such as transmittance, reflectance, emissivity, and color and because Proscia discloses that discovering an optimum value of the result effective variable (layer thicknesses) involves only routine skill in the art.

Regarding claims 7, 17 and 20, Depauw discloses that the layers are preferably applied by sputtering (column 5, lines 60-61). The applicants disclose in the specification that zinc oxide is a polycrystalline material when applied in thin films via sputtering (see specification page 12, lines 17-18). The applicants also disclose that thin layers of silicon nitride can be thought of as substantially amorphous even after tempering (see specification page 12, lines 22-23). Therefore, it appears that the zinc oxide layers of Depauw are polycrystalline and the silicon nitride layers of Depauw are amorphous.

Regarding claim 24, Depauw discloses that the physical thickness of each layer of a composite layer may be no more than about 22.5 nm (Table A).

3. Claims 8 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,090,481 to Depauw in view of USPN 5,248,545 to Proscia as applied to claims 1, 3, 5-7, 9, 11, 13, 15-17, 19-20 and 24 above, and further in view of USPN 5,837,361 to Glaser et al. (hereinafter referred to as Glaser).

Depauw discloses that a sacrificial metal layer, such as a titanium layer, may be disposed above each infrared reflective silver layer (column 5, lines 11-12 and lines 46-54), but DePauw does not specifically mention a layer of niobium. Glaser discloses that titanium and niobium are known sacrificial metal layers (column 3, lines 49-61). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the sacrificial metal layer from any suitable sacrificial metal, such as niobium, as taught by Glaser, because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability.

4. Claims 1, 3, 5-7, 9, 11, 13, 15-17, 19-20 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,090,481 to Depauw in view of USPN 5,248,545 to Proscia in view of USPN 6,030,671 to Yang et al. (hereinafter referred to as Yang) in view of USPN 4,900,634 to Terneu et al. (hereinafter referred to as Terneu).

Regarding claims 1, 3, 5-7, 9, 11, 13, 15-17, 19-20 and 24, Depauw discloses a coating carried by a substrate having a surface comprising from the substrate surface outwardly an inner dielectric layer, a first infrared reflective layer, an intermediate dielectric layer, a second infrared reflective layer, and an outer dielectric layer (column 3, lines 26-39). Depauw discloses that each dielectric layer can be a composite layer formed of successive subsidiary layers of different compositions from each other (column 5, lines 31-40 and Table A). Depauw discloses that the dielectric materials include zinc oxide, tin oxide, and silicon nitride (column 5, lines 23-30). Depauw discloses that the physical thickness of each layer of a composite layer may be no more than about 250A (Table A). Therefore, Depauw discloses a coating carried by a substrate comprising an intermediate dielectric stack comprising zinc oxide/silicon nitride/zinc oxide/silicon nitride/zinc oxide.

Depauw does not mention a specific embodiment wherein each of the layers of the first dielectric have an optical thickness greater than the optical thickness of any of the layers of the second dielectric, but DePauw does disclose that a variety of layer thickness combinations may be utilized (see Table A). Depauw appears to be silent with regards to why the intermediate dielectric stack thicknesses are to be varied, therefore, it would have been obvious to look to the prior art for the reason. Proscia provides this conventional teaching by disclosing that the optical features and properties (transmittance, reflectance, emissivity, and color) of a glass coated article

can be readily determined empirically by those skilled in the art or, for example, by employing a commercially available optics prediction software program. Proscia discloses that typically a graphic presentation of the optical properties of a given glazing article, sorted by individual layer thickness and refractive index, can be used to determine the regions of optimum film stack design (see entire document including the paragraph bridging columns 6 and 7). Considering that the current specification fails to teach or suggest unexpected results relating to the claimed thickness construction, and considering that the applicant fails to evidence any unexpected results associated with the claimed thickness construction, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the thicknesses of the layers, such as currently claimed, because it is understood by one of ordinary skill in the art that layer thicknesses determine properties such as transmittance, reflectance, emissivity, and color and because Proscia discloses that discovering an optimum value of the result effective variable (layer thicknesses) involves only routine skill in the art.

In the event that it is shown that Depauw does not disclose the use of an intermediate dielectric stack comprising silicon nitride with sufficient specificity, Yang is relied upon to disclose that it is known in the art that silicon nitride protects an infrared reflective layer material from oxidation and corrosion while increasing the visible light transmission of the film (see entire document including column 6, lines 20-32). It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the intermediate dielectric stack with silicon nitride, because silicon nitride protects the infrared reflective layer material from oxidation and corrosion while increasing the visible light transmission of the film.

In the event that it is shown that Depauw does not disclose the use of an intermediate dielectric stack comprising alternating thin layers of an oxide and silicon nitride with sufficient specificity, Terneu is relied upon to disclose that it is known in the art that internal defects affect haze and that thinner layers result in less haze (see entire document including column 2, lines 23-68). It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the intermediate dielectric stack with alternating thin layers of an oxide and silicon nitride, rather than a single thick layer of silicon nitride, because internal defects affect haze and that thinner layers result in less haze.

Regarding claims 7, 17 and 20, Depauw discloses that the layers are preferably applied by sputtering (column 5, lines 60-61). The applicants disclose in the specification that zinc oxide is a polycrystalline material when applied in thin films via sputtering (see specification page 12, lines 17-18). The applicants also disclose that thin layers of silicon nitride can be thought of as substantially amorphous even after tempering (see specification page 12, lines 22-23). Therefore, it appears that the zinc oxide layers of Depauw are polycrystalline and the silicon nitride layers of Depauw are amorphous.

Regarding claim 24, Depauw discloses that the physical thickness of each layer of a composite layer may be no more than about 22.5 nm (Table A).

5. Claims 8 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,090,481 to Depauw in view of USPN 5,248,545 to Proscia in view of USPN 6,030,671 to Yang in view of USPN 4,900,634 to Terneu as applied to claims 1, 3, 5-7, 9, 11, 13, 15-17, 19-20 and 24 above, and further in view of USPN 5,837,361 to Glaser.

Depauw discloses that a sacrificial metal layer, such as a titanium layer, may be disposed above each infrared reflective silver layer (column 5, lines 11-12 and lines 46-54), but DePauw does not specifically mention a layer of niobium. Glaser discloses that titanium and niobium are known sacrificial metal layers (column 3, lines 49-61). It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the sacrificial metal layer from any suitable sacrificial metal, such as niobium, as taught by Glaser, because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability.

Response to Arguments

6. Applicant's arguments filed 2/7/2007 have been fully considered but they are not persuasive.

The applicant asserts that by limiting the thickness of the second and fourth intermediate dielectric layers the "stress, absorption, etc." would by be unexpectedly limited. The examiner respectfully disagrees.

Firstly, these alleged unexpected results are not mentioned by the specification and they do not flow from the teachings of the specification. Although the applicant asserts that the alleged unexpected results must be considered based on *In re Zenitz*, the examiner respectfully disagrees. In the decision of *In re Zenitz* the court held that the specification supported the unexpected properties (tranquilizer effect with less hypotensive effect) because the specification indicated the compounds use as hypotensive agents as well as tranqilizers. Unlike Zenitz, the current specification is completely silent regarding the stress, absorption, etc. effects of limiting the thickness of the second and fourth intermediate dielectric layers.

Secondly, as demonstrated by USPN 5,110,637 to Ando, it was known in the low emissivity glass art (column 1, lines 9-14) that low stress levels can be achieved by using alternating layers of an oxide and a nitride (column 11, lines 35-43 and column 14, lines 59-63). Further, WO 99/45415 to Le Masson (USPN 6,503,636 is cited as a translation document) discloses that it was known in the low emissivity glass art that low stress levels can be achieved by using alternating layers of an oxide and a nitride (column 2, lines 30-52).

The applicant asserts that the cited prior art provides no motivation to for varying the intermediate dielectric stack layer thicknesses as claimed. The examiner respectfully disagrees. Depauw does not mention a specific embodiment wherein each of the layers of the first dielectric have an optical thickness greater than the optical thickness of any of the layers of the second dielectric, but DePauw does disclose that a variety of layer thickness combinations may be utilized (see Table A). Depauw appears to be silent with regards to why the intermediate dielectric stack thicknesses are to be varied, therefore, it would have been obvious to look to the prior art for the reason. Proscia provides this conventional teaching by disclosing that the optical

features and properties (transmittance, reflectance, emissivity, and color) of a glass coated article can be readily determined empirically by those skilled in the art or, for example, by employing a commercially available optics prediction software program. Proscia discloses that typically a graphic presentation of the optical properties of a given glazing article, sorted by individual layer thickness and refractive index, can be used to determine the regions of optimum film stack design (see entire document including the paragraph bridging columns 6 and 7). Considering that the current specification fails to teach or suggest unexpected results relating to the claimed thickness construction, and considering that the applicant fails to evidence any unexpected results associated with the claimed thicknesses, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the thicknesses of the layers, such as currently claimed, because it is understood by one of ordinary skill in the art that layer thicknesses determine properties such as transmittance, reflectance, emissivity, and color and because Proscia discloses that discovering an optimum value of the result effective variable (layer thicknesses) involves only routine skill in the art.

In response, the applicant asserts that Depauw is not concerned with varying the layer thicknesses of the intermediate dielectric stack. The applicant asserts that the relative thicknesses of the individual layers making up the intermediate stack do not affect the optics of the coating. Firstly, the applicant has failed to show, or attempt to show, that the relative thicknesses of the individual layers making up the intermediate stack do not affect the optics of the coating. It is well settled that unsupported arguments are no substitute for objective evidence. In re Pearson, 494 F.2d 1399, 1405, 181 USPQ 641, 646 (CCPA 1974). Secondly, Table A clearly illustrates Depauw varying the intermediate dielectric stack layers. Depauw is

clearly concerned with varying the thickness of the intermediate dielectric stack individual layers.

In response to applicant's argument that DePauw does not address layer stress issues, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T. Piziali whose telephone number is (571) 272-1541. The examiner can normally be reached on Monday-Friday (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (571) 272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

3/19/07

atp

ANDREW PIZIALI
PRIMARY EXAMINER